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Process for Developing and Implementing an Ecosystem Monitoring Plan for Las Cienegas National Conservation Area

Background: Las Cienegas National Conservation Area (LCNCA) and Sonoita Valley Acquisition Planning District (SVAPD) were designated by Congress and signed into law by the President on December 6, 2000, to conserve, protect and enhance the unique and nationally important resources and values of the public lands within the NCA, while allowing livestock grazing and recreation to continue in appropriate areas. LCNCA and SVAPD encompass 95,609 acres and are a mix of BLM, Arizona State Land, and private ownership. The LCNCA supports five of the rarest habitat types in the American Southwest: cienegas, cottonwood-willow riparian forest, sacaton grasslands, mesquite bosques, and semi-desert grasslands. It is also home to 6 federally listed species, is on the National Register of Historic Places, and has two proposed Wild and Scenic River segments.

In June 2003, BLM's Las Cienegas Resource Management Plan (RMP) was completed. The plan identifies desired future conditions for upland and riparian sites on the NCA and surrounding watershed, criteria for meeting these conditions; and a series of quantitative resource objectives for upland (grassland and savanna), riparian, and aquatic habitats. In addition, the plan directs that an ecosystem approach be taken to manage the five rare habitats so as to achieve and maintain quantitative resource objectives for priority fish and wildlife species in the planning area.

Under the approved Las Cienegas RMP the public lands are open to livestock grazing and recreation. The RMP implements an adaptive management strategy and includes livestock grazing and recreation management actions as well a series of other management actions to meet the desired resource conditions for upland and riparian vegetation, wildlife habitats, and cultural and visual resources. According to the RMP, *monitoring data will be collected and evaluated to periodically refine and update desired conditions and management actions.*

BLM has been conducting inventories and collecting monitoring data for nearly twenty years on LCNCA. Prior to the initiation of the ecological monitoring program, most of these data had not been adequately archived, analyzed and integrated to determine the status and trend of LCNCA's ecological systems and associated species. Similarly, existing protocols had not been analyzed to determine how well they related to RMP objectives and how effective they were in determining trends to support adaptive management strategies. In response, the LCNCA monitoring program is designed to produce an ecosystem-level monitoring plan for LCNCA complete with summaries of current resource and ecological conditions, user guides for scientific peer-reviewed, field-tested protocols and processes for evaluation of monitoring information in an adaptive management framework.

Public Involvement: At the local level, the Sonoita Valley Planning Partnership (SVPP), a voluntary association of federal, state, and local agencies, organizations and private citizens who share a common interest in the resources and management of public lands within the Sonoita Valley, worked collaboratively with BLM to develop Las Cienegas RMP over eight years. The group was instrumental in the designation of the NCA, and continues to work with BLM on plan implementation including the monitoring program development and implementation.

Project Overview: The Las Cienegas Ecological Monitoring Program is envisioned as a robust ecosystem-level monitoring plan for the LCNCA. The monitoring plan is designed (i.e., with adequate statistical power) to detect changes in the ecological health/integrity of upland, riparian, and aquatic habitats before critical thresholds are crossed and permanent damage to these systems occur. Likewise, positive changes to the ecosystem will also be detectable allowing for an accurate depiction of resources condition over time. In order to develop the program, the baseline conditions of the resource are being identified through the compilation and synthesis of current monitoring and research information collected over the last 14 years. Second, the effectiveness of current monitoring efforts is being evaluated based on

the monitoring needs identified in the RMP. Third, efforts are underway to develop, field-test and implement an ecosystem-level monitoring plan for the LCNCA.

The products of this work will include: A *State of Las Cienegas National Conservation Area* report detailing the current condition of habitats, target species, and anthropogenic stresses; a spatially explicit database of existing monitoring data; a database framework for entering future monitoring information; a statistically robust ecosystem-level monitoring plan complete with field tested protocols and baseline information.

There are three aspects of this monitoring plan that are innovative in their approach:
1) The ecosystem-level scope of the monitoring plan;
2) The statistical power of the individual protocols within the plan; and
3) The coordination and integration of the monitoring information into ongoing community and regional level planning efforts.

Project Description and Methodology:

Design and Implementation of a cost-effective, habitat and threat-based ecosystem monitoring program for LCNCA involves the following steps and objectives:

1. *Production of a State of the LCNCA report.* The goal of this step is to analyze the available inventory, monitoring and research data to determine status and trend of upland, riparian and aquatic habitats, priority species, and stresses on these habitats and species for the LCNCA and surrounding watershed. All relevant data, analysis products and interpretative material will be made available in digital format so that, if desired, it can be placed on BLM's website and made available to the public. A systematic approach is taken in this step including characterization of desired future conditions using the best scientific information available; construction of ecological models that will summarize the current state of knowledge regarding system dynamics and will assist in setting thresholds (expressed in terms of the parameters characterizing desired future condition) that will trigger changes in management; analysis, summary and interpretation of all relevant inventory, monitoring, and research data to determine status and trend of each habitat; and evaluation of how these data and results address RMP goals and objectives.

2. *Conduct a quantitative review of existing monitoring data and protocols*. The goal of this step is to evaluate the statistical power of existing protocols to detect change (i.e., amount of change and over what time period) and to determine how well existing monitoring and research data address RMP management goals and objectives. As part of this component of the study, literature is reviewed and experts are queried to identify alternative monitoring protocols. Alternative and current protocols are then tested against the following criteria: how well they address and inform management goals and objectives, their statistical power to detect change, and their relative implementation costs (data collection, analysis, presentation).

3. *Development of a monitoring plan for the LCNCA and implementation of on-the-ground monitoring.* The goal of this step is to draft a monitoring plan based on the preceding information and analyses, which is peer-reviewed by agency and University experts as well as the LCNCA Technical Team. The program emphasizes protocols that are efficient, cost-effective and feasible to implement and that address key indicators of ecosystem health and compliance monitoring requirements such as those included in Biological Opinions. As part of the implementation phase, partnerships are pursued between BLM and others including agencies (NPS, US Forest Service, Natural Resource Conservation Service, Arizona Game and Fish Department), University of Arizona, and other interested stakeholders (SVPP, conservation organizations, citizen scientists) to share in the collection and analysis of monitoring data. The Nature Conservancy will also train the appropriate BLM staff in new monitoring protocols.

4. *Coordination of monitoring efforts on the NCA with other regional monitoring efforts.* The goal of this step is to support creation of an ecosystem monitoring network for the Sonoran Desert region. The network concept, developed by the NPS Sonoran Desert Inventory Monitoring Program and Sonoran Institute (SI), involves engaging professionals from the universities, agencies, and non-profit organizations to implement bi-national, cooperative ecological monitoring of the Sonoran Desert region. To the greatest extent possible, common, effective monitoring protocols will be emphasized so that data can be compared throughout the region. Common tools for data archiving, database management and analysis of network monitoring data are being explored by NPS and SI. Monitoring at this level will enable researchers and land managers to detect regional trends and will facilitate production of a periodic State of the Sonoran Desert Report. This assessment of the condition of natural resources will provide critical support for decision-making and information to the public.

Budget & Timeline: The estimated funding needed for this project when it was initiated in 2004 was $138,000. Instead of a lump sum, funding has been received in smaller amounts from FY2004 to FY2008. To date BLM has contributed $26,000 in BLM base funding and $106,000 in BLM Challenge Cost Share Funding directly to this project. The Nature Conservancy and other partners have provided an equivalent amount in matching contributions. Annual base funding to support all inventory and monitoring work on Las Cienegas NCA excluding the direct costs of monitoring program development has increased each year from 69K in FY04 to 91K in FY05 and 135K in FY06.

The monitoring program is being developed and implemented in a phased approach as funding becomes available. The Upland Monitoring Phase has been completed and the Riparian/Aquatic Phase is in nearing completion.

Issues: BLM Partners including SVPP participants have been very supportive overall of the monitoring program development in LCNCA.

Program Staff in the Field Office and State Office raised several concerns about the development of an ecological monitoring program in LCNCA including:

- Concerns about modifying existing protocols and preference to continue existing monitoring.
- Concerns about whether standard protocols will be followed that fit with BLM policy.
- Concerns that the extra effort being put into LCNCA's monitoring program will set a precedent that other areas will be pressured into following.
- Concerns about the potential for increased time commitments needed for monitoring as well as for public involvement in monitoring
- Concerns about perceptions and political ramifications of who is chosen as the partner for monitoring program development (in our case this was The Nature Conservancy)

These important concerns are still being addressed as LCNCA monitoring program development continues.

Lessons Learned:

- The monitoring program must at a minimum meet all BLM regulations and policy related to monitoring and monitoring protocols.
- In addition, the monitoring protocols used should not be one size fits all and should meet the needs of each area, based on landscape, resources, plan objectives and issues.
- The monitoring program must strive to maintain existing time commitments to monitoring and to build partnerships that increase the capacity for monitoring.
- The monitoring program should be developed with input from resource staff as well as partners.
- Ensuring independent scientific peer review of monitoring protocols and monitoring plans will help validate the effort.
- Regional coordination on monitoring will provide additional opportunities for resource and data sharing.